Environmental Monitoring Report

Project No.: 43150-022
Bi-annual report (July – December 2016)
March, 2017

Tajikistan: Regional Power Transmission Project

Prepared by: State Establishment “Project Management Unit for Electroenergy Sector”

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## ABBREVIATIONS

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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>BT</td>
<td>Barqi Tojik</td>
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<td>CEP</td>
<td>Committee for Environmental Protection</td>
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<td>EA</td>
<td>Executive Agency</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMMP</td>
<td>Environmental Mitigation and Monitoring Plan</td>
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<td>EMS</td>
<td>Energy Management System</td>
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<td>ES</td>
<td>Environmental Specialist</td>
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<td>ESM</td>
<td>Environmental Supervisor and Monitor Expert</td>
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<td>FAT</td>
<td>Factory Acceptance Tests</td>
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<td>HSE</td>
<td>Health, Safety and Environment</td>
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<td>GOST</td>
<td>Gosudarstvennye Standarty (Russian Technical Standards)</td>
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<td>GoT</td>
<td>Government of Tajikistan</td>
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<td>IEE</td>
<td>Initial Environmental Examination</td>
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<td>NCC</td>
<td>National Control Center</td>
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<tr>
<td>OHL</td>
<td>Overhead line</td>
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<tr>
<td>OPGW</td>
<td>Optical ground wire</td>
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<td>OTL</td>
<td>Overhead Transmission line</td>
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<tr>
<td>PMU</td>
<td>Project Implementation Unit</td>
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<td>PMUES</td>
<td>Project Management Unit Energy Sector</td>
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<tr>
<td>PPE</td>
<td>Personal Protective equipment</td>
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<td>RoW</td>
<td>Right of Way</td>
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<td>BUNCC</td>
<td>Back-Up National Control Centre</td>
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<td>SCC</td>
<td>Secondary Control Center</td>
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<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
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<td>SSEMP</td>
<td>Site-specific Environmental Management plan</td>
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<td>SS</td>
<td>Substation</td>
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<td>TL</td>
<td>Transmission Line</td>
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<tr>
<td>TOR</td>
<td>Terms of Reference</td>
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<td>UPS</td>
<td>Uninterruptible Power Supply</td>
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I. INTRODUCTION

1.1. Project Description

1. This six bi-annual environmental monitoring encompasses the Project which intends (i) to rehabilitate existing and construct new transmission assets in order to strengthen Tajikistan’s interconnection with Afghanistan, the Kyrgyz Republic, and Uzbekistan; (ii) to install Supervisory Control and Data Acquisition System (SCADA); and (iii) to improve the quality of electricity supply on regional and national level. Additionally, the Project will consider opportunities for non-physical investments and address the issues of governance and operational efficiency improvements.

2. The Project shall enhance electricity interconnections with Afghanistan, Kyrgyz Republic, and Uzbekistan through: (i) replacement of equipment in 500kV and 220kV substations that are important for regional power transmission; and (ii) expand 220kV network to improve reliability of connections with Afghanistan and the Kyrgyz Republic.

3. Kayrakkum – Asht TL, North: The Kayrakkum – Asht TL is located on approx. on 70.4 km distance on a 50 m wide corridor for the transmission lines according to the related regulations for transmission lines of the Republic of Tajikistan. Approximately 255 conventional and angle lattice towers are installed with an average distance of 288 m.

4. Geran – Rumi TL, South: The Geran – Rumi Transmission Line is located approx. on 78 km distance on a 50 m wide corridor for the transmission lines according to the related regulations for transmission lines of the Republic of Tajikistan. Approximately 275 conventional and angle lattice towers are installed with average distance of 285 m.

5. Lot -1: Sughd – Kayrakkum TL, is located on approx. on 63,3 km distance on a 50 m wide corridor for the transmission lines according to the related regulations for transmission lines of the Republic of Tajikistan. Approximately 174 conventional and angle lattice towers are installed with an average distance of 363 m.

6. Lot-2: Rehabilitation of Regar SS, Baypaza, Kayrakkum, Rumi and construction of Geran SS. The additional construction of a substation is required to receive the 220 kV line. The area is adjacent to the existing substation, on the opposite site of the road. For the recent time this land is used for agricultural industry. An area of 10 ha in a square shape would be required.

7. The project has been categorized as Category B: Minor impacts able to mitigate are expected to occur. The transmission lines run through areas with low environmental sensitivities and do not traverse any village or settlement. Distances to any dwelling or settlement will be kept at a minimum of 50 meters. No significant or irreversible impacts are expected with the operation of the new lines. There were some temporary impacts during the construction phase but appropriate mitigation measures have been developed. The IEE concluded, if the environmental management and monitoring program is properly implemented, these impacts will not be significant. Findings gained through ADB’s and Fichtner’s field surveys confirm this Project status. Figure 1 below shows location of project sites in scale of the country.
1.2. Objective and Methodology of Bi-Annual Report

8. The purpose of this bi-annual environmental monitoring report is to review compliance of project activities with the EMMP and the Health, Safety and Environmental Plan. This Report was prepared for the second part of 2016, from July to December 2016.

9. Additionally, the purpose of this sixth and final bi-annual environmental monitoring report is to satisfy the environmental safeguarding requirements of the Government of Tajikistan and the Asian Development Bank (ADB) as well as to fulfill the requirements written into the grant document for the Government (Open Stock Holding Company “Barqi Tojik”, Ministry of Energy and Water Resources) of the Republic of Tajikistan.

10. Report was prepared on the basis of monthly engineering progress reports and quarterly monitoring progress reports submitted by the Contractors (Kalpataru Power Transmission Ltd on the Lot 1 and consortium of ALSTOM Grid Energy Industrial A.S. – GENSER Genel Muhendislik Taah. ve Tic. A.S. on the Lot 2 and Alstom Grid S.A.S on the Lot 3), and on findings obtained during the supervision and monthly inspections by PMU environmental experts for monitoring environmental impacts executed between July and December 2016. Further, the PMU environmental specialists regularly supervised environmental monitoring of relevant parameters administered by the Contractors as well as additionally reviewed project design, social and associated documents.
1.3. Changes in project organization and Environmental management team
Institutional Framework

11. The Executing Agency (EA) is the Open Stock Holding Company “Barqi Tojik” (BT). The EA has set up a Project Management Unit (PMU) to manage day-to-day coordination, implementation, monitoring and administration activities of the project. The schematic below shows the structure of the environmental management team.

![Institutional Chart for rehabilitation of the Environmental Safeguards Arrangement](image)

Figure 2. Institutional Chart for rehabilitation of the Environmental Safeguards Arrangement

12. As per TOR the Consultant (Fichtner GmbH & Co. KG) has one international and one national expert foreseen for the environmental matters of this project. Within OSHC ‘Barqi Tojik/PMU’ an Environmental Monitoring Department exists that is in full operation. This department is responsible for the performing of the mitigation and regular monitoring measures as outlined in the IEE Report. In addition to his duties (as outlined in the TOR), the international environmental expert Mr. Hans Back from Fichtner is supporting PMU experts with annual inspections and additional training on all environmental issues related to this project within the frame of the available person-months.

13. Currently this department consists of 5 specialists, including the Head of the Department – see Table 1 below.

Table 1: PMU organizational arrangements for Environmental Monitoring

<table>
<thead>
<tr>
<th>No</th>
<th>Social Sector and Environmental Monitoring Department(^1) of PMUES</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head of Department</td>
<td>Mr. Sirojiddin Karimov</td>
</tr>
</tbody>
</table>

\(^1\) It is also commonly referred to as “Monitoring Department”
2. Main specialist on social and environmental issues
Mr. Hisrav Sharipov

3. Main specialist on social and environmental issues
Mr. Aziz Kholov

4. Main specialist on social and environmental issues
Ms. Takhmina Aslamova

5. Leading specialist on environmental issues
Ms. Shahlo Khokiroeva

14. This department is responsible for all projects, financed by international organization except one - World Bank Energy Loss Reduction Project, which set up its own PMU. The Social Sector and Environmental Monitoring Department shall (i) work within the Barqi Tojik/PMU to ensure all statutory environmental submissions under CEP requirements and other environmentally related legislation are fully implemented; (ii) work within the Barqi Tojik/PMU to ensure all environmental requirements and mitigation measures resulting from the environmental assessment of the project are included in the contract prequalification and bidding documents for suppliers and contractors; (iii) support the development of any additionally needed IEE and IEE requirements that become apparent following fine tuning; (iv) provide training and project awareness for Barqi Tojik and PMU staff and project stakeholders; (v) communicate with the CEP and people affected by the Project; (vi) initially supervise and monitor Contractor’s first construction measures; (vii) investigate complaints.

15. Mr. Aziz Kholov (tel.+992985487378) was appointed by the PMU as environmental specialist to ensure that this project activity is in compliance with the EMMP and HSE Plan. One HSE specialist was appointed from Construction Contractor for Lot 1 - Kalpataru Power Transmission Ltd. – Mr. S. Kirubakaran (tel.+992937775405). He is also responsible for the implementation of all HSE aspects stipulated in the EMMP and in the contractor’s HSE Plan. As for Lot 2 Construction Contractor - consortium Alstom Grid Energy Industrial A.S. – Genser Genel Muhendislik Taah. ve Tic. A.S. – Mr. Kh. Kurbonov (tel.+992919041064) was appointed as HSE specialist.

16. No changes in project organization structure occurred during the reporting period. There were no changes in CSC project organization team. Thus, the responsibility of fulfilling environmental requirements of the Government of Tajikistan and conducting the required level of environmental assessment consistent with ADB guidelines lies within the PMU of the EA. Project Consultant assist the PMUES in this regard. IEE reports were approved by the State Ecological Expertise of the Republic of Tajikistan on November 27th, 2014.

1.4. Relationships with Contractors, PMU and ADB

17. Relationship with contractors and sub-contractors. As was indicated above, within the framework of this project, there were engaged 3 contractors, two of which are working in consortium: Kalpataru-Power Transmission Ltd (license number No.0220001568 issue date 24.05.2013, Genser Genel Muhendislik Taah. Ve Tic A.S. (license number No.00055098 issue date 14.04.2013)).

18. Contractors provided six progress reports with parts on environmental issues for the period of July-December 2016. The meetings were held as personally, during field inspection, contractor’s staff visit to PMUES. Furthermore communication is arranged by phone, through correspondence via e-mail.
19. **Relationship with SE PMUES.** Regular meetings with PMU engineers were conducted, monitoring results, on-site inspection also environmental audit on completed construction site were discussed.

20. **Relationship with ADB.** Weekly meetings are conducting with ADB Mission in Tajikistan, where regularly is discussed status of compliance with protection environmental measures under the project. Jointly with specialist of ADB protection measures M. Babajanova (RETA 8663) was conducted environmental audit of completed construction site on Geran-Rumi TL, Geran SS also carried out jointly inspections on Regar substation during the November 2016. During the meeting and jointly inspections ADB environmental safeguards specialist M. Babajanova provided consultations, guidance and instructions of implementation of environmental protection measures requirements on different aspects (waste management, workplace and health safety, reporting activities, filling check-lists for final post-construction environmental audit and etc.)

21. PMUES environmental specialist A. Kholov participated in meeting/seminar on implementation of environmental safeguards within the frameworks of ADB project implementation in December 2016. Furthermore cooperation with safeguards specialist of ADB (RETA 8663) is carried out via e-mail, telephone communication and personal meeting for discussing of risen issues.

1.5. **Construction activities and progress during first 6 months 2016**

1.5.1. **Contracts Details**

22. Following are contracts details with Construction Supervision Consultant company (CSC) and Contractors of this project:

   a) The contract with CSC - Consortium Fichtner GmbH and Tepsco-Project Consultant construction supervision - was signed on 1st September 2011 – for the period to 31/12/2016 – 64 months.

   b) The contract was signed with “Kalpataru - Jyoti Company – Consortium” for the project implementation of Lot 1 - for the period from 11/02/2013 or 2014 to 31/12/2016 - 46 months

   The contractor conducted research on the two new overhead lines (North and South) in general. Sub-contracts were concluded for construction works with JSC "Tadzhikgidroelektromontazh", JSC "TADES", LLC "Tadzhikgidroenergostroy" and "Genser" Company.

   After payment of resettlement compensation, contractor has begun construction on the Northern Line in July 2014, and completed most of the works in May 2015. The South line civil works has been completed in March 2016.

   Contractor signed at the expense of project a new contract for construction of 220 kV TL “Sughd-Kayrakkum”, which was started in June 2014, after compensation to affected people and completed in December 2016.

   On 18th November 2013 the contract was signed with the consortium company "Alstom-Genser Consortium» (Germany) for the project implementation of Lot 2 for the period till 23 August 2016 – 33 months. The Contractor completed all works related to research and design for all construction sites. The construction works under this lot were started in October 2014. The works were completed in August 2016.
c) The Contract for the project implementation of Lot 3 with Company “Alstom Grid SAS” was signed on 12 September 2014 for the period till 26 March 2017 – 29 months.

23. The works on the Lot 3 have started in November 2015. Installation and construction works completed, site commissioning is ongoing which should be completed by March 2017.

1.5.2. **Construction activities and their compliance with environmental safeguards**

Lot-1. OHL 220 kV and extension of 220 kV substation

24. The Contractor worked intensively and its activity for the first six months of 2016 are shown in Tables 2-4 below:

**Table 2: Construction activities for Lot 1** (under the Contract with Consortium led by Kalpataru Power Transmission Ltd. company) – July-December 2016

<table>
<thead>
<tr>
<th>No.</th>
<th>Month, 2016</th>
<th>Activities</th>
</tr>
</thead>
</table>
| 1   | July        | Sughd-Kayrakkum OHL, Spitamen district  
• Construction and foundation concrete casting for 34 OHL towers  
• Installation of 40 towers |
| 2   | August      | Sughd-Kayrakkum OHL  
• Construction and foundation concrete casting for 45 OHL towers  
• Installation of 47 towers  
• Wire tensioning, 25 km |
| 3   | September   | Sughd-Kayrakkum OHL  
• Construction and foundation concrete casting for 48 OHL towers  
• Installation of 49 towers  
• Wire tensioning 21 km |
| 4   | October     | Sughd-Kayrakkum OHL  
• Installation of 38 towers  
• Wire tensioning, 19 km |
| 5   | November    | Sughd-Kayrakkum OHL  
• Wire tension is completed |
| 6   | December    | Sughd-Kayrakkum OHL  
• Construction works on TL are completed  
• Equipment testing and commissioning |

25. Under this Lot 1 construction works for OHL Kayrakkum-Asht and Kayrakkum and Asht substations were completed in 2015.

26. Main construction works on Geran-Rumi OHL were completed by June 2016, and on “Sughd-Kayrakkum” (Spitamen region) were completed by December 2016. All workers used protective means as helmets, gloves and securing equipment. Also there were warning signs on sites. Contractor complied with safety requirements.

27. Contractor cleaned up all construction sites starting from the end of April 2016. ES of PMUES conducted final environmental audit of completed construction sites of Geran-Rumi OHL together with ES of Kalpataru.
28. No complaints on environmental issues received from local people as was confirmed during conversation with representatives of Jamoat Kurush in Spitamen district.

29. Final environmental audit was conducted on some completed construction sites and check-list of final post-construction environmental audit is attached in Annex 2.

**Lot-2. Rehabilitation of 500/200 kV SS and construction of new Geran-2 SS**

30. Construction activities for the Lot 2 on Geran-Rumi, Baypaza and Regar sub-stations are shown in the Table 3 below.

**Table 3: Construction activities for the Lot 2** (under the Contract with Consortium led by Alstom Grid Energy Industrial A. S. company) – July-December 2016

<table>
<thead>
<tr>
<th>No.</th>
<th>Month, 2016</th>
<th>Activities</th>
</tr>
</thead>
</table>
| 1   | July        | **Geran substation:**  
  • Soil grading of the service road by excavator is completed  
  • Soil ramming of service road by the roller is completed  
  • Backfilling and road sub grading by the grave is continued  
  • Reinforcing installation of service road is completed.  
  **Kayrakkum substation:**  
  • Foundation reinforcing of portal (Sughd feeder) is completed  
  • Installation of formwork under the portal foundation (Sughd feeder) is completed  
  • Casing under the under the portal foundation (Sughd feeder) is completed  
  **Baypaza substation:**  
  • Base coat and coloring of portals is continued.  
  • Connection of copper conductors to the steelworks.  
  **Rumi substation:**  
  • Soil ramming of foundation of equipment. |
<table>
<thead>
<tr>
<th>Date</th>
<th>Events</th>
</tr>
</thead>
</table>
| 2 August | - Laying of control and power cables into cable channels.  
- **Regar substation:** Planning and ramming of the Switchgear area.  
- Soil ramming of foundation of equipment.  
- **Geran substation:** Concrete casting of service road in completed.  
- Laying of copper conductors of earthing ring.  
- **Kayrakkum substation:** Waterproofing with bitumen of portal foundation (Sughd feeder)is completed  
- 110 kV circuit breakers dismantling is completed  
- **Baypaza substation:** Manual Soil excavation for foundation under equipment is completed.  
- Casting of leveling concrete layer of foundation under equipment is completed.  
- Reinforcing of foundation under equipment is completed  
- **Rumi substation:** cable strap and connection to terminal-block cabinet is completed.  
- Cable strap and connection to equipment is continued.  
- **Regar substation:** Manual Soil grading at Switchgear area is completed.  
- Rehabilitation of cable channels in completed.  
- 12.08.2016. Completed works at substation were accepted by working committee |
| 3 September | - Backfilling of copper conductors by earth ring is completed.  
- Installation of pipes of drainage system is completed.  
- Backfilling of pipes of drainage system is completed  
- **Kayrakkum substation:** Reconstruction works in control building for new equipment 110kV Switchyard is completed.  
- Area planning of 220kV Switchgear is continued.  
- Rehabilitation of road at 220/110kV Switchgear is completed.  
- **Baypaza substation:** Waterproofing course of foundation under equipment is completed.  
- Dismantling of old equipment is completed.  
- **Rumi substation:** Soil Grading at substation area is completed.  
- Base coat and coloring of existing portals is completed |
| 4 October | - Backfilling of cable channels are completed.  
- Soil ramming of foundation under equipment is completed.  
- Laying of control and power cables is completed  
- **Kayrakkum substation:** Electrical installation works in control building are completed  
- Installation of metallic cover of cable channels is completed.  
- Filling of isolating gas of GIS equipment is completed.  
- 27.10.2016. Completed works at substation were accepted by working committee.  
- **Baypaza substation:** Rehabilitation of steelworks of portals by the elevator is completed.
• Planning of 220kV Switchgear area is completed.
• Installation of concrete surfacing of cable channels is completed.
• 13.10.2016. Completed works at substation were accepted by working committee.
• **Rumi substation:**
  • Soil grading of substation area is completed.
  • Base coat and coloring of existing portals is completed.

5 November
• Geran: works are not carried out
• Kayrakkum: all works are completed
• Baypaza: all works are completed
• Rumi: works are not carried out

6 December
• Geran: 03.12.2016, Completed works at substation were accepted by working committee.
• Kayrakkum: all works are completed
• Baypaza: all works are completed
• Rumi: 02.12.2016, Completed works at substation were accepted by working committee.

Table 4: **Construction activities on Lot 3 for the previous 6 month** (under the contract with Alstom Grid S.A.S. company) North regions, South regions and central regions – July-December 2016

<table>
<thead>
<tr>
<th>No.</th>
<th>Month, 2016</th>
<th>Activities</th>
</tr>
</thead>
</table>
| 1   | July        | • Completion of repair works, NCC/SCC.  
      |             | • Control room, RCR works are continuing  
      |             | • Installation of telecommunication equipment  
      |             | • Training room NCC – repairing woks are continuing  
      |             | • Repairing works in telecommunication room of NCC are continuing |
| 2   | August      | • Telemetry site works  
      |             | • Installation of telecommunication equipment.  
      |             | • OPGW works are continuing  
      |             | • UPS installation |
| 3   | September   | • Commissioning UPS  
      |             | • Shipment of diesel generator  
      |             | • Installation of telecommunication equipment is completed  
      |             | • Commissioning of telecommunication equipment  
      |             | • Installation works of OPGW are continuing |
| 4   | October     | • Works on the site (i.e. at the substations) on telemetering  
      |             | • Installation works of OPGW are completed  
      |             | • Construction and commissioning works at the NCC are continuing |
| 5   | November    | • Works at the site on telemetry installation are continuing  
      |             | • Commissioning works in NCC are continuing |
| 6   | December    | • Purchasing and installation of diesel tank is on the completion stage  
      |             | • Installation of diesel generator is on the completion stage  
      |             | • Works at the site on telemetry are in the completion stage  
      |             | • Testing of telecommunication system, circuit testing  
      |             | • All works in the NCC are completed |
31. Under Lot 3 following works were done and completed:

- Works on SCADA FAT has started on 23 May and completed by 10 June 2016.
- OPGW cables and BARKO displays are delivered.
- PDS system have been installed in the BT and connected through VPN to Massy.
- On the job training for personnel of BT was conducted in Massy, France in January 2016.
- Supply of telecommunication equipment and OPGC cables were completed by March 2016.
- Repair works on SCC were successfully completed in May 2016.
- Establishment of database in OJT for FAT was finished in March 2016. OJT group will participate in preparation of FAT, starting from 6 April 2016.

1.5.3. **Construction facilities and compliance with environmental safeguards**

**Lot 1: Kalpataru’s Construction camps**

32. Kalpataru Power Transmission Ltd had one construction camp for workers on construction of “Sughd-Kayrakkum” line region B. Gafurov, Obshoron village from January 2015 to December 2016. The camp was rented and established at existing storage area belongs to private person. It consisted of living rooms for workers and storage site for construction materials.

33. All construction materials and spare parts were relevantly stored, under the roof, part of them covered by tarpaulin which is in compliance with requirements of EMMP/HSE Plan.

34. Temporary toilet has been installed on the territory of the camp. Wastewater from the toilet flows into septic tanks and are in compliance with requirements of the EMMP/HSE Plan.

35. Hazardous and industrial wastes are stored properly using roofed protective containers.

36. Fire extinguishers, sand, hooks and other fire-fighting devices were in place, not expired.

37. HSE representatives of CC Kalpataru in the field demonstrated in section daily check-lists for fire-fighting equipment, HSE arrangements for tower cranes, for store management check-lists, records for HSE trainings for workers, Complaints log register as part of environmental documentation system. Updated SSEM for Sughd-Kayrakkum transmission line were available in the field office as well as monthly reports.

**Lot 2: Genser’s construction camp**

38. Genser Genel Muhendislik Taah. ve Tic. A.S. had one construction camp for workers located at the territory of new Geran-2 sub-station. Status of construction camp at Geran-Rumi sub-station area was mostly in compliance with the requirements: there are warning signs installed at the entrance of new substation; workers were well equipped by PPE; premises and all sanitary conditions, including fire-fighting equipment are in place.

39. HS issues and sanitary conditions are also comply with the requirements. (see Figures below).
Figure 4. Geran sub-station: entrance of construction site where constructions works are going on and construction camp is functioning (Contractor - ALSTOM-Genset) – all warning and information signs are in place – September 2016

Figure 5. Geran substation: fire fighting system and sanitary conditions for workers in construction camp are in compliance – September 2016

40. Working time was from 7 a.m. to 7 p.m. - in compliance.
41. Construction equipment, vehicles were in good condition – no any oil spills were observed at construction sites. The maintenance schedule was demonstrated.

42. Barrels with transformer oil are stored on relevant basis, no spills observed. All spare parts are in order – in compliance.

Figure 6. Geran sub-station: Containers with transformer oil and spare parts are stored on special basis – in compliance, July 2016

43. Previous wooden wastes were delivered to “Barqi Tojik” and taken away from the area of Geran-Rumi sub-station. The new one is stored at the area of the sub-station.

Figure 7. Geran sub-station: new wooden wastes (boxes) from equipment are stored temporarily at the area of sub-station – July 2016.

44. Household waste is collected in special hole at the area and this hole for temporary storage of household wastes located near the substation site was full. The Contractor transported wastes and properly disposed it at relevant landfill of Kumsangir district.
Figure 8. Geran substation - sanitary waste were gathered in special pot-hole temporarily, then removed regularly – status of area in July 2016

45. Containers for wastes are also placed at the area of constructing substation.

Figure 9. Geran sub-station: cleaned and completed area – October 2016

Figure 10. Construction of new Geran sub-station – workers are provided by PPE, part of sub-station electric part is fenced and warning signs are installed– status in October 2016

46. Used equipment for concrete preparation was relatively small. Cement and inert materials were purchased by Contractor from the market and local companies using existing quarries in accordance with relevant permissions from local authorities.
47. In July 2016 Contractor took care of trees planted and constructed water channels (what was per request of local authorities and people) – see Figure 14 below.

48. Representatives of Contractor demonstrated that SSEMP are available in the office of Contractor, and instructions and records on training for workers on HS issues.

49. There is GRM mechanism as per information of PMUES, complaints log book is in place.
50. Final environmental audit was conducted in December 2016, when all construction works were completed, check-lists of final environmental audit are attached in Annex-2.

**Regar substation 500 kV**

51. No living premises for workers in this construction site were organized because all engineering and auxiliary personnel were housed in private apartment. Office of Contractor and Supervision Consultant was located inside the area of sub-station. Area of this substation is very well protected and nobody can entry without special permission or other document.

![Figure 14. Entrance of Regar sub-station and office of Contractor - September 2016](image1)

52. Works on replacing of old equipment at Regar SS were completed in August 2016. Old dismantled equipment was delivered to the administration of Regar sub-station and stored properly at the area – relevant document is in place.

![Figure 15. Replaced equipment and dismantled parts – October 2016](image2)

![Figure 16. Replaced equipment at Regar sub-station – surface was covered by gravel after installation works – October 2016](image3)

53. All spare parts are stored properly – in compliance.
54. Wooden wastes were delivered to the administration of Regar sub-station.

55. Part of equipment was installed inside the control unit of the sub-station.

56. Engineers of Contractor demonstrated instructions and records on trainings for workers on HS issues conducted in period from July to December 2016.
57. Complaints log was in place during the visits – as per administration confirmation of substation no complaints received from workers. Local people are living at the distance more than 200 m from the sub-station – nobody can enter illegally to the area.

58. Working time for project works was from 7 a.m. to 7 p.m. - in compliance.

59. Disposal of household wastes was not separated from sub-station system. Currently only 10 workers are continuing their work at sub-station for defect liability period which will start in 2017. There is no separate working camp organized at the area.

60. Final post-construction environmental audit was conducted in December 2016, after completion of all construction/replacement works and check-list is attached in Annex 2.

**Lot 3: SCADA/EMS and NCC**

61. Alstom Grid did not arrange any separate construction camp with premises for the staff, involved for the works on Lot 3 because all engineering and auxiliary personnel were housed in private apartments.

62. In period from July to December 2016 project works included mainly activities related to repair of Control Centre of Sistemavtomatica by sub contractor, i.e. works on SCADA system and installation of equipment.

63. All requirements related to HSE issues were followed – workers had regular trainings and instructions on HSE issues, PPE were provided, working time was limited from 8 a.m. and 18 p.m.

64. Records of trainings were in place during inspection by PMUES. No complaints from workers were received. No accidents were registered during reporting period.
II. Environmental Monitoring

2.1. General

65. Within the framework of the project’s environmental management, the supervision tasks consist of continuous monitoring by the PMUES, environmental monitoring and management of project implementation and assistance in ensuring the implementation of environmental management practices at each stage of the construction. The monitoring is performed in accordance with the Environmental Monitoring and Management plan (EMMP) in pursuant to ADB’s environmental safeguards policies and the environmental regulations of Republic of Tajikistan. The monitoring report covers activity on construction (project implementation) in the second half of the year – from July to December 2016.

66. The environmental monitoring consists of two logical parts: (1) monitoring of the compliance with EMMP and HSE Plan; and (2) monitoring of the ambient environmental conditions. The assessment of compliance with the EMMP and HSE Plan commenced with the review of the environmental management conditions required for compliance during the construction stage of the project. The other part of the biannual environmental monitoring was the monitoring of ambient environmental condition. During second half of 2016 instrumental monitoring of the environment quality was conducted only for noise level.

67. Visual observations of the ambient environmental condition of the project areas were done during the site visits in reporting period.

2.2. Noise and Vibration

68. Monitoring of works showed that construction and installation works on towers foundations and erection (Geran-Rumi OHL) were limited in time and ended latest 8 p.m. No complaints were received and/or recorded from the inhabitants. To reduce noise mainly generated by heavy construction equipment during their operation, these machines were equipped with silencers or vehicles with low sound output are used.

69. As for vibration issues no cracks or other damages were observed during the site visits for the period of July-December 2016.
70. Instrumental monitoring of noise level was conducted only at Geran-2 SS construction site at places where intensive construction works caused more noise were carried out:

- Point 1 at 20 meters from the equipment Concrete production plant (Latitude: 37°20'26.28"N Longitude: 68°43'34.46"E)
- Point 2 at 20 meters from the Reinforcement Steel cutting device (Latitude: 37°20'25.38"N Longitude: 68°43'37.06"E)

71. Data on noise level are shown in the Table 5 below.

Table 5: Noise level monitoring data

<table>
<thead>
<tr>
<th>Location</th>
<th>Noise Standards in dBA (max)</th>
<th>Baseline measure</th>
<th>Monitoring of measuring data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete plant</td>
<td>80-80 dBA</td>
<td>80-80 dBA</td>
<td>N/A</td>
</tr>
<tr>
<td>Steel cutting device</td>
<td>80-80 dBA</td>
<td>80-80 dBA</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Data span (range) from 13.00 to 13.20

Standards:
55-45 dBA (max) - Residential area
75-75 dBA (max) - Commercial area
80-80 dBA (max) - Industrial area
50-40 dBA (max) - Hospitals
55-55 dBA (max) - Schools, Library

72. Relevant Noise and Vibration Management Plan was prepared and attached as Annex to an updated EMMP/HSE plan.

2.3. Water Quality

73. Geran, Regar and Rumi SS are located far from some surface and soil waters. No need was on water sampling and analytical testing.

74. No spills of oil or fuel in Geran, Regar and Rumi SS territory were observed what could contaminate surface or groundwater. All kinds of measures provided in HSE were followed by Contractor to avoid release of oil or fuel into the river.

2.4. Air Quality

75. All heavy equipment and machines are compliance with the EMMP.

76. Fuel-efficient and well-maintained haulage trucks are used to minimize exhaust emissions. Trucks were regularly checked in vehicle inspection stations as well. Stockpiled soil and sand were slightly wetted before loading when project works are conducted during windy conditions.

77. Vehicles transporting soil, sand and other construction materials were covered with tarpaulins.

78. Speed limits are set and controlled. No transport movement through densely populated area is allowed
79. Used concrete plants (equipment) were rather small and located at relevant distance from sensitive receptors

80. No air quality instrumental monitoring was proposed under EMMP.

**Dust Suppression**

81. During hot and windy season dust suppression through watering was conducted at Geran SS. Dust suppressions were not necessary because of wet weather conditions from October to December 2016. No complaints were received from workers and from the population on this issue.

**2.5. Flora and Fauna Monitoring**

82. No trees cutting were done by Contractor during reporting period. Rehabilitation/construction works were carried out mainly in areas far from any protected assets.

83. Special devices for avian fauna protection were installed on towers of Sughd-Kayrakkum transmission line.

![Figure 22. There is special devise to protect avian fauna – installed bird guards – September 2016, Spitamen district.](image)


84. No accidents were registered during the reporting period. Relevant measures were undertaken by contractors during implementation of project works to comply with all the requirements and measures for the protection of occupational health and safety (Contractor’s HSE Plan):

- Contractors developed a safety training program, consisting of an initial course on health and safety. All workers have to attend the safety training courses starting from the first week of employment. Technical safety instructions courses are held on a monthly basis.
- Workers and engineers are provided with protective equipment and clothing, e.g. helmets, special work wear, safety belts, gloves, protective glasses etc. A first aid center has been properly equipped.
• Each three months, the Contractor held an instruction course on HIV / AIDS.

• Briefings on technical safety, labor and environmental protection (including electromagnetic fields) were held for the workforce on a daily basis.

### III. Environmental Management

#### 3.1. EMMP, SSEMP\(^2\) and Work Plans

85. The Initial Environmental Examination of February 2010 (updated in February 2012 and May 2014) contains an Environmental Management Plan (in the following named EMMP – Environmental Mitigation and Monitoring Plan) stipulating mitigation and monitoring measures for the design, construction, commissioning and operation phases. One of the requirements within this EMMP is that the construction contractor shall set up a safety plan to the construction activities. In February 2014, Kalpataru Power Transmission Ltd., the Contractor, submitted an Health, Safety and Environment Management Plan (in the following called HSE Plan) for the avoidance of risks to the health of the workforce on the job site as well as for the protection of the environment as a site-specific plan made on the basis of the Initial Environmental Examination for this project. Then this document for Northern line was revised in November-December 2014 in accordance with ADB requirements after consultations and explanations of RETA 8663 national environmental specialist (NES). GENSER Genel Muhendislik Taah. ve Tic. A.S. also prepared SSEMP for Geran-Rumi substation site, which was reviewed by RETA 8663 NES.

86. Thus SSEMP for Lot 1 and Lot 2 were developed. Under Lot 3 SSEMP was not developed.

87. The assessment of compliance with the Environmental Monitoring and Management Plan (EMMP) and the Contractor’s Health, Safety and Environment Management Planning (HSE Plan) commenced with a review of the environmental management requirements for compliance during the construction stage of the project.

88. The Contractors submitted 6 progress reports with HSE sections for July-December 2016.

#### 3.2. Site Inspections and Audits

89. From July to December 2016 number of site inspections (16-18.08.2016, 15-16.09.2016, 20-23.10.2016, 17-18.11.2016 and 8-22.12.2016) were conducted by ES and specialist of the Department of social and environmental monitoring of PMUES to verify the effectiveness of environmental protection measures in achieving the goals specified in the environmental monitoring and management plan (EMMP), check the compliance with EMMP and SSEMP during the inspections, to conduct post-construction final environmental audit. A number of environmental and safety issues were observed and noted. These issues were subsequently brought to the attention of the personnel concerned on the Project Consultant’s side as well as discussed with the Contractor’s side. The issues observed were generally related to potential contamination in construction camps, and sanitation conditions at Contractor’s camps and some other minor problems.

\(^2\)Site Specific Environmental Management Plan. In case of South Route the SSEMP is part of HSE Plan prepared by the Contractor. However Contractor’s HSE Plan needs to be revised in accordance with IEE/EMP and environmental safeguards requirements.
During the inspections visual surveys on-site, meetings with workers, contractor, environmental engineers, local environmental authorities and specialists were conducted.

### 3.3. Non-Compliance Notices

The status of actions done to fulfill non-compliance notices indicated in previous Bi-annual report of January-June 2016 is shown in Table 6 below.

#### Table 6: Status of non-compliance notices fulfillment

<table>
<thead>
<tr>
<th>No</th>
<th>Environmental issues identified</th>
<th>Corrective actions to be taken</th>
<th>Deadlines to resolve the issues</th>
<th>Status of fulfillment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Household wastes are collected in special hole at the area and this hole for temporary storage of household wastes located near the sub-station site was full.</td>
<td>Take urgent measure to transporting of wastes and their proper disposal at relevant landfill site of Kumsangir district</td>
<td>by mid of July 2016</td>
<td>fulfilled</td>
</tr>
<tr>
<td>2</td>
<td>Reinstatement of completed construction sites</td>
<td>Conduct final audit and fill checklist on remained completed construction sites for all Lots and submit with next bi-annual report</td>
<td>Starting from July 2016</td>
<td>fulfilled</td>
</tr>
<tr>
<td>3</td>
<td>Noise level monitoring</td>
<td>Continue noise level measurement at all construction sites if necessary</td>
<td>Regularly (1 time in 3 month) according to EMP</td>
<td>fulfilled</td>
</tr>
<tr>
<td>4</td>
<td>EMMP trainings</td>
<td>Implement a training program which was recommended within the IEE of 2010</td>
<td>Up to next bi-annual reporting</td>
<td>Fulfilled</td>
</tr>
<tr>
<td>5</td>
<td>Availability of complaints log and other environmental documents</td>
<td>Ensure once more that SSEMP and complaints log book are still in place in field offices of Contractor – in Geran-Rumi substation, Regar sub-station and Baypaza sub-station (log book with daily records)”</td>
<td>regularly</td>
<td>Fulfilled</td>
</tr>
<tr>
<td>6</td>
<td>Restoration of area at completed construction sites</td>
<td>Conduct post-construction environmental audit</td>
<td>December 2016</td>
<td>fulfilled</td>
</tr>
</tbody>
</table>

No any non-compliance notice for reporting period was issued. During the defect-liability period ES of PMUES will check the status of project sites.

### 3.4. Complaints and Consultation

During this reporting period PMUES and project Consultant did not receive any complaints from residents according reports of national specialists on environmental.

ES of PMUES met with local people and environmental departments in order to inform them on on-going project activities and also to receive feedback.
ANNEXES

Annex 1. Photos of completed construction sites

Annex 2. Checklists of post-construction environmental audit of completed construction sites
Annex 1. Photos


Figure 6: Control building Geran – 2 – installed new equipment -December 2016.


Photo 16: Rehabilitated National Control Centre Building - Dushanbe, OSHC “Barki Tojik”
Annex 2. Checklists for post-construction environmental audit of completed construction sites

<table>
<thead>
<tr>
<th>No</th>
<th>Type of work</th>
<th>Impact</th>
<th>Measures as per</th>
<th>Control</th>
<th>Carried out measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project site vegetation rehabilitation (re-vegetation)</td>
<td>Change of land cover, erosion resulting from the construction activities</td>
<td>Proper landscaping with drainage</td>
<td>SEPMU</td>
<td>Landscape restored to its previous state</td>
</tr>
<tr>
<td>2</td>
<td>Oil management</td>
<td>Equipment and machinery repairing/maintenance</td>
<td>All oil spills on soil surface must be removed and disposed relevantly</td>
<td>SEPMU</td>
<td>All fuel leakages are removed from soil surface</td>
</tr>
<tr>
<td>3</td>
<td>Waste management</td>
<td>Waste accumulation, air and soil pollution</td>
<td>Collect and disposal all wastes at designated location;</td>
<td>SEPMU</td>
<td>All wastes took away at the whole construction sites</td>
</tr>
<tr>
<td>4</td>
<td>Remove useless equipment</td>
<td>Housekeeping matters</td>
<td>Contractor equipment and machinery removed;</td>
<td>SEPMU/Contractor</td>
<td>Contractor is removed main equipment</td>
</tr>
<tr>
<td>5</td>
<td>Road reinstatement</td>
<td>Road damages causing pollution, traffic disturbance and accidents.</td>
<td>Access road reinstated to pre-construction or better conditions</td>
<td>SEPMU/Contractor</td>
<td>The approach roads are restored</td>
</tr>
<tr>
<td></td>
<td>Existing Infrastructure facilities</td>
<td>Damage or disturbance to existing services (supply of electricity, water, gas, telecom etc.)</td>
<td>Reinstatement to pre-construction conditions or proper relocation, to be certified by the service companies</td>
<td>SEPMU/Contractor</td>
<td>The condition before construction is restored</td>
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<td>6</td>
<td>Camp site facilities</td>
<td>Residual pollution and disturbance to the localities</td>
<td>All temporary facilities removed and cleaned up</td>
<td>SEPMU/Contractor</td>
<td>All cleaned and removed</td>
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"Alstom – Genser Consortium"

Contractor’s Rep. 31.01.2017

Kadirov Sh.

Government agency “Power management Unit for electro-energy sector”

Project Manager – S. Emomov
Check list for environmental audit of the completed civil works

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"Kalpataru - Jyoti Company - Consortium"

Government agency "Power management Unit for electro-energy sector"

Project Manager – S. Emomov